



MILLION Solar ROOFS

SUCCESS STORIES

The goal of the Million Solar Roofs Initiative is to install one million solar energy systems on U.S. buildings by 2010. President Clinton announced the Initiative on June 26, 1997 in a speech before the United Nations Session on Environment and Development. The Initiative focuses on two types of solar energy technology — photovoltaics that produce electricity from sunlight, and solar thermal systems that produce heat for domestic hot water, space heating or heating swimming pools. The U.S. Department of Energy leads this effort in partnership with the building industry, other federal agencies, utilities, the solar energy industry, financial institutions, state and local governments, and non-governmental organizations. These partnerships concentrate on removing market barriers and developing and strengthening demand for solar energy products and applications. As progress is made toward the goal of one million solar roofs, greenhouse gases and other harmful emissions will be reduced, high tech jobs will be created, and the U.S. solar energy industry will retain its competitive edge.



Project: Sholder Family Residence

Type: Solar Electric Back-Up System

Location: Evergreen, Colorado

Background: In March 1998, Public Service Company of Colorado filed a tariff with the Colorado Public Utilities Commission to install up to 200 net metered systems in Colorado by 2001, resulting in the creation of *Solarsource*[™], a solar electric program implemented by Altair Energy of Colorado. Officially announced in July 1998, the *Solarsource*[™] program provides Altair Energy and Public Service Co. of Colorado customers with the option of purchasing some or all of their power from the sun's energy by installing a photovoltaic system on or adjacent to their home or business. As of January 2000, Altair Energy had installed nearly 60 residential grid-connected systems in Colorado as a result of the partnership. The majority of customers who have participated in this program have chosen to include back-up power features on their grid-connected systems. Back-up systems, such as the one featured in this case study, provide energy to pre-selected appliances during utility outages. Altair Energy has found that back-up features add significant customer value to grid-tied solar electric systems.

System Description: This 7,000 square foot home features a 2.4 kilowatt electric back-up system comprised of 32 Siemens 75 watt crystalline modules that have been ground-mounted about 25 feet from the home. The system includes two Trace SW 5548 inverters and a battery bank, which stores electricity for use during power outages. Both the inverters and battery bank are stored in two compact cabinets located in the basement of the home. The system generates approximately 3,100 kWh of electricity per year, meeting about one-quarter of the family's household electric needs.

The system is net metered, sending excess power back into the utility grid. The home's electric meter runs backward when the system produces more electricity than is being used by the house, crediting the customer for this excess energy on his/her electric bill. If the home requires more energy than the PV system produces, it uses electricity from the utility grid.



This PV system has the added benefit of providing back-up power to the well pump, heat circulation pump, refrigerator, computer, selected lights and home security system during utility outages. Although the family has utility power, they live in a mountain community that is susceptible to frequent power outages as a result of lightning, wind, and snow storms.

Once power is restored, the system will resume its normal operation, producing electricity during the day to power appliances, selling excess power back to the utility, and recharging the battery bank for future power outages.

Financing: The system was a cash purchase. Altair Energy helped the customer take advantage of a state rebate that was available in Colorado until December 31, 1999, and a federal cost-sharing program through the Utility PhotoVoltaic Group's TEAM-UP program. These incentive programs reduced the total system cost, including installation, by about 17 percent.

Climate: The system was installed in a harsh mountain area at an elevation of about 8,000 feet. The site receives snow on a regular basis between the months of October and April, with an average yearly temperature of 40 degrees Fahrenheit. Evergreen, Colorado receives about 6.6 peak sun hours per day in the summer months and 4.4 peak hours a day during the winter.

Total Installed Cost: The total cost was approximately \$30,000.

Maintenance Issues: Maintenance costs are expected to be minimal. Operation and maintenance includes customer-performed quarterly battery maintenance/fluid check. The system contains no moving parts, making it extremely durable, with a lifetime of thirty years or more. The solar modules come with a twenty-five year warranty. Additionally, every Altair Energy solar electric back up system comes with a two-year installation and performance warranty.

Direct Saving: On average, the family's monthly electric bill is reduced by about 25 percent.

Environmental benefit: The solar electric back-up system was a clean and quiet solution to the frequent outages the family experienced and offered them a way to give something back to the fragile environment in which they live. According to the Environmental Protection Agency's solar environmental benefits calculator (found on the EPA website), this installation will avoid one pound of nitrogen oxide and 5,389 pounds of carbon dioxide emissions per year.

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